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Ahmad K. Naimzada • Silvana Stefani •
Anna Torriero (Eds.)

Networks, Topology and Dynamics

Theory and Applications to Economics and Social Systems

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Prof. Ahmad K. Naimzada
Università degli Studi di
Milano-Bicocca
Dipto. Economia Politica
Piazza dell' Ateneo Nuovo, 1
20126 Milano
Italy
ahmad.naimzada@unimib.it

Prof. Anna Torriero
Università Cattolica del Sarcro
Cuore
Largo A. Gemelli, 1
20123 Milano
Italy
anna.torriero@unicatt.it

Prof. Silvana Stefani
Università degli Studi di
Milano-Bicocca
Dipto. Economia Politica
Piazza dell' Ateneo Nuovo, 1
20126 Milano
Italy
silvana.stefani@unimib.it

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Preface

There is convergent consensus among scientists that many social, economic and financial phenomena can be described by a network of agents and their interactions. Surprisingly, even though the application fields are quite different, those networks often show a common behaviour. Thus, their topological properties can give useful insights on how the network is structured, which are the most "important" nodes/agents, how the network reacts to new arrivals. Moreover the network, once included into a dynamic context, helps to model many phenomena. Among the topics in which topology and dynamics are the essential tools, we will focus on the diffusion of technologies and fads, the rise of industrial districts, the evolution of financial markets, cooperation and competition, information flows, centrality and prestige.

The volume, including recent contributions to the field of network modelling, is based on the communications presented at NET 2006 (Verbania, Italy) and NET 2007 (Urbino, Italy); offers a wide range of recent advances, both theoretical and methodological, that will interest academics as well as practitioners.

Theory and applications are nicely integrated: theoretical papers deal with graph theory, game theory, coalitions, dynamics, consumer behavior, segregation models and new contributions to the above mentioned area. The applications cover a wide range: airline transportation, financial markets, work team organization, labour and credit market.

The volume can be used as a reference book for graduate and postgraduate courses on Network Theory and Complex Systems in Faculties of Economics, Mathematics, Engineering and Social Sciences. In Part I, the invited tutorials introduce Graph Theory from the theoretical point of view (Marusic) and the possible applications to economics (Battiston). In Part II, the contributions cover local and global interaction, complex behavior, network games, while in Part III they refer to Markov chains and topology. The applications are all placed in Part IV.

Fifteen papers have been selected among roughly thirty submitted extended abstracts; each paper has been reviewed by two referees. Space limitations are the main reason why no more papers have been accepted, although many of them were really interesting.

We are grateful to the scholars who have made NET 2006, NET 2007 and this book possible, to the members of the scientific committees of the two conferences and the referees:

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Ahmad K. Naimzada
Silvana Stefani
Anna Torriero

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